



Adjustment to severe disability: constructing and examining a cognitive and occupational performance model

Naomi Schreuer^a, Arie Rimmerman^b and Dalia Sachs^a

Ninety adults with severe physical disabilities were tested with respect to their adjustment to severe disabilities in their adapted computerized work environment 1 year following occupational therapy consultation. The research goal was to examine a model that incorporates variables from the cognitive coping model (self-esteem, appraisal, and social support) and variables from the occupational performance model (engagement in activities, involvement in work/study, time of typing performance, and environmental adaptations). Findings showed goodness of fit between the observed and the proposed research models, although few changes in positions and relations were found. Self-esteem and time of performance were found to be core variables connecting cognitive and functional variables. Age and activities of daily living were the only background variables that contributed to the model. Research and rehabilitation clinical implications are discussed.

Neunzig körperlich stark behinderte Erwachsene wurden hinsichtlich ihrer Anpassung an starke Behinderungen in ihrem angepassten rechnergestützten Arbeitsumfeld 1 Jahr nach Beratung mit Beschäftigungstherapeuten getestet. Das Forschungsziel bestand darin, ein Modell zu untersuchen, das Variablen des kognitiven Bewältigungsmodells (Selbstwertgefühl, Schätzung und gesellschaftliche Unterstützung) und Variablen des beruflichen Leistungsmodells (Teilnahme an Aktivitäten, Beteiligung an Arbeit/Studie, Sicherheit beim Maschinenschreiben und Umfeldanpassungen) enthält. Die Ergebnisse zeigten eine Anpassung zwischen den beobachteten und vorgeschlagenen Forschungsmodellen, obwohl Positions- und Relationsänderungen gefunden wurden. Das Selbstwertgefühl und die Zeit der Leistung erwiesen sich als Hauptvariablen, die die kognitiven und funktionalen Variablen verbinden. Das Alter und die alltäglichen Aktivitäten waren die einzigen Hintergrundvariablen, die zu dem Modell beigetragen haben. Diskutiert werden die klinischen Auswirkungen von Forschung und Rehabilitation.

Se evaluaron a noventa adultos con discapacidades físicas intensas en relación con sus ajustes ante sus discapacidades intensas en los ambientes laborales computarizados en que laboraban, después de 1 año de haber asistido a la consulta de terapia ocupacional. El objetivo del estudio fue evaluar un modelo en el que se reúnen variables tomadas de un modelo de afrontamiento cognitivo (autoestima, valoración, y apoyo social) y variables tomadas del modelo de desenvolvimiento ocupacional (participación en

actividades, participación en el trabajo/estudio, tiempo de rendimiento al mecanografiar, y adaptaciones al ambiente). Los resultados mostraron una buena correlación entre el modelo propuesto y los modelos estudiados, aunque se hallaron algunas diferencias en cuanto a las posiciones y relaciones. Se halló que la autoestima y el tiempo de rendimiento fueron variables esenciales que interrelacionan a las variables cognitivas con las funcionales. La edad y las actividades cotidianas fueron las únicas variables generales que contribuyeron al modelo. Además, se discuten la investigación y las implicaciones para la rehabilitación clínica.

Quatre-vingt-dix adultes souffrant de handicaps physiques sévères ont subi des tests de portant sur leur adaptation au handicap grave dans leur environnement de travail informatisé 1 an après la consultation de thérapie du travail. L'objectif de cette recherche était d'examiner un modèle incorporant certaines variables du modèle d'adaptation cognitive (valorisation personnelle, évaluation et assistance sociale) et certaines variables du modèle de performance professionnelle (participation à des activités, participation au travail/études, vitesse dactylographique et adaptation à l'environnement). Les résultats indiquent une bonne adéquation entre les modèles de recherche observés et proposés, malgré certaines modifications au niveau des positions et des relations. Il a été établi que la valorisation personnelle et la performance dactylographique constituaient des variables clés reliant les variables cognitives et fonctionnelles. L'âge et les activités de la vie quotidienne étaient la seule variable contextuelle à contribuer au modèle. Ce document débat des recherches et des implications cliniques de la rééducation. *International Journal of Rehabilitation Research* 29:000-000 © 2006 Lippincott Williams & Wilkins.

International Journal of Rehabilitation Research 2006, 29:000-000

Keywords: adjustment, cognitive, occupational performance model, severe disability, technology

^aOccupational Therapy Department and ^bSchool of Social Work, Faculty of Social Welfare and Health Studies, University of Haifa, Mount Carmel, Israel.

Correspondence and requests for reprints to Dr Naomi Schreuer, Occupational Therapy Department, Faculty of Social Welfare and Health Studies, University of Haifa, Mount Carmel, Israel 31905.
Tel: +972 4 8240551; fax: +972 4 8249753;
e-mail: schreuer@research.haifa.ac.il

Received 11 November 2005 Accepted 25 January 2006

Introduction

People with severe physical disabilities have a considerably lower participation rate in society due to their limited functioning, societal attitudes, and other environmental barriers. Therefore, they need to undergo a lifelong adjustment process in order to reach the proper balance between their personal goals, their performance, and societal demands (Kendall and Terry, 1996; Rimmerman *et al.*, 2000; Tzonichaki and Kleftras, 2002).

Most of the previous studies on people with severe disabilities have followed the medical model, with the primary focus on the impact of disability on functioning while minimizing the role of environment (Desrosiers *et al.*, 2003; Lutz and Bowers, 2003; Liu *et al.*, 2004). The current approach, represented by the World Health Organization (WHO) International Classification of Functioning, Disability and Health (ICF), is to shift the attention to social and environmental factors in the rehabilitation process. This means that the impact of the impairments on daily functioning is studied in parallel to the impact of social and environmental factors on the participation of people with disabilities (Bent *et al.*, 2001).

The purpose of this article is to present a research model of adjustment to severe disability based on the inputs of cognitive and functional occupational theories. The cognitive approach deals primarily with the stress process and resources for coping with the social network and environmental demands (Pearlin and Schooler, 1978; Lazarus and Folkman, 1984; Livneh and Wilson, 2003). The functional occupational approach addresses the skills and performance required in order to comply with the activities needed to carry out tasks and roles, despite the disability (Baum and Christiansen, 2005).

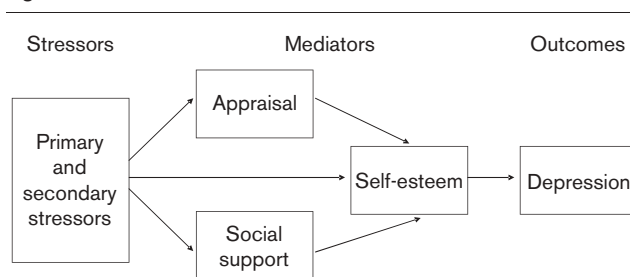
Theoretical construct

Coping theories

There are four central assumptions that serve as the theoretical basis for studying the adjustment process to severe disability: (1) a severe physical disability is a long-term stressor; (2) an individual cognitive appraisal is crucial to the adjustment process; (3) the individual must be active in this process; and (4) human and environmental support may facilitate adjustment and reduce the consequences of the disability (Maes *et al.*, 1996; Barnwell and Kavanagh, 1997; Caya and Liem, 1998; Grooms and Leahy, 2002).

There are a variety of cognitive coping approaches utilized in studying the stress and adjustment process to disability (Antonovsky, 1979; Antonak and Livneh, 1991; McCarthy *et al.*, 1997; McCubbin, 1998). One core research construct used is Lazarus and Folkman's transactional theory, which views stress as a threat beyond an individual's coping resources due to environ-

Fig. 1



The stress process. Adapted from Pearlin *et al.* (1981).

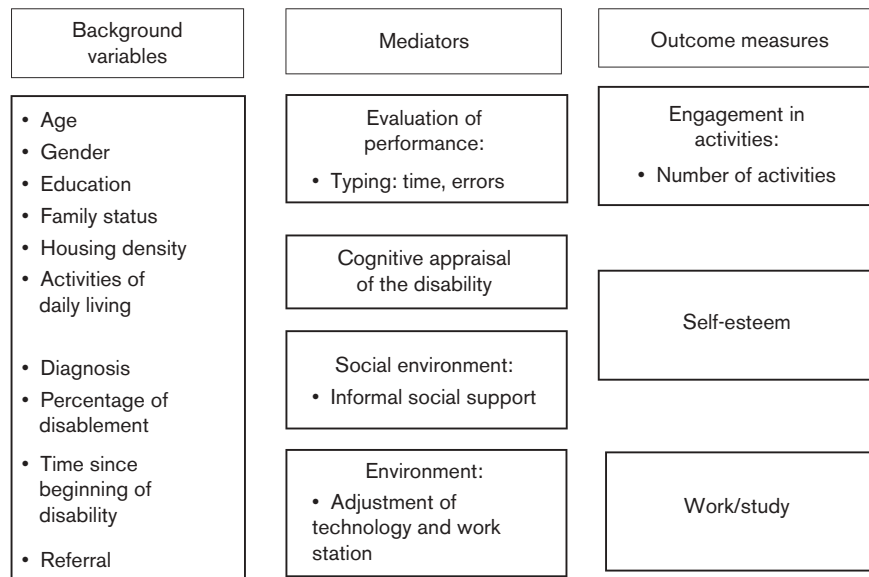
mental demands (Lazarus and Folkman, 1984, 1985). This approach implies that a person's attribution of person-environment interaction to a specific stressor evokes particular coping responses for dealing with the situation, either effectively or ineffectively, even to an extent that might be harmful (Grooms and Leahy, 2002).

A similar model for coping with stress chosen for this research is that of Pearlin and Schooler (1978). This model defines severe disability as a primary stressor, which in turn causes secondary stressors affecting such aspects as one's body image or well-being. Throughout the life-long adjustment process to these stressors, positive cognitive appraisal (internal resource) of the disability, as well as social support (external resource), may serve as buffers. As such, they may affect the level of one's self-esteem (secondary mediator) and depression (outcome) (Fig. 1). Therefore, cognitive appraisal, social support and self-esteem are the core cognitive variables used as predictors of adjustment to disability in the suggested model (Pearlin and Schooler, 1978; Pearlin *et al.*, 1981).

Functional occupational theories

A widely used concept in occupational therapy is 'occupational performance'. This concept focuses on the goodness of fit between the person, his/her meaningful occupation, and the contexts in which his/her performance is taking place (Christiansen, *et al.*, 1995; Law, 2002; Shaw and Polatajko, 2002). In the context of disability, the focus is on closing the gap between people with disabilities and people without disabilities with regard to their daily performance and engagement in social roles (Livneh and Wilson, 2003; National Organization on Disability, 2003; Vestling *et al.*, 2003). In other words, these occupational theories address individuals' performance in relation to their personal variables, the demands of the desired occupation, and the particular environmental setting and context. In the current research, persons with severe disabilities will be considered to perform meaningfully in their occupational role

Fig. 2



The suggested model of adjustment to physical disability.

when they can express their personal potential and when their physical environment, including computers, are optimally adapted to their needs (Livneh and Antonak, 1997; WHO, 2001; Baum and Christiansen, 2005).

Adaptation of computers and the work environment

The use of assistive technology for people with severe disabilities is aimed at increasing their level of engagement in work and their participation in various activities by reducing physical barriers and enhancing the fit between an individual's occupation and the environment. This reflects the role of technology in the new classification of the World Health Organization (WHO, 2001). Thus, the integration of individuals with disabilities in the workplace requires modification of the environment and work methods, as well as the introduction of assistive technology. Adaptation of the work environment and use of assistive technology have been increasingly emphasized as occupational therapy interventions for this population. This is, however, a transactional process between the user, the context, the activity desired, the assistive technology, and the professional support available.

In addition, using assistive technology among people with disabilities may have various secondary effects, including the facilitation of new occupational opportunities, increased participation, greater satisfaction, and higher quality of life (Jutai, 1999; Day *et al.*, 2001). Research results have shown that when such modifications are made in the work environment of people with disabilities,

their level of integration at work doubles and they lose fewer working days – all at a lower cost than expected (Krause *et al.*, 1999; Schwochau and Blanck, 2003).

The research model

The research model is based on incorporating cognitive and occupational performance theories (Fig. 2). Specifically, the combination of Lazarus and Folkman's coping approach, together with the occupational performance model (Fig. 1), is quite innovative for disability research (Lazarus and Folkman, 1984, 1985). Adjustment is the outcome measure and consists of self-esteem as the cognitive measure, and work/study status and engagement in activities as the functional participation measures. The mediating variables are cognitive appraisal and social support (cognitive measures), along with adaptation of the computerized work environment and performance of a computer task (functional measures).

In order to test the research model, the researchers controlled for 11 personal and disability variables. Two of them were chosen for the model, according to the correlation found with research mediating and outcome measures.

Method

Participants

The participants consisted of 90 adults with severe physical disabilities, who had never worked or studied at a higher education level and who were being treated during the year 2000 in three Karten Rehabilitation Centers in

Israel. These centers specialize in the adaptation of the work environment using assistive technology. Of the original sample of 120 clients, a total of 90 participants (50% women, 50% men) were identified for this follow-up research 1 year following consultation. The reasons for non-participation were death, refusal due to poor health, suspicions that we represented the national insurance agency, and difficulty in locating clients around the country.

Procedure

The researchers obtained permission from the Karten Rehabilitation Centers to carry out follow-up research 1 year following intervention. After receiving the participants' permission, five occupational therapists visited and evaluated them in their actual adapted computerized work environment. The evaluation process took approximately 2 h.

Instruments

Seven instruments were used to examine the four main groups in the model: the outcome measures, the internal mediators, the external mediators, and the background variables.

The outcome measures

The outcome measures chosen for this study were self-esteem and two functional measures: number of activities in which the subjects were engaged during their adulthood and their work/study status.

The Self-Esteem Assessment (cognitive) (Rosenberg, 1965) consists of 10 items rated on a four-point scale, ranging from 'strongly agree' to 'strongly disagree'. The internal consistency coefficient for the 10 items was previously reported to be 0.92 (Rosenberg, 1979). The current research found good internal consistency, with a coefficient of 0.88 for 9 of the 10 items. The tenth item was dropped due to a different content of happiness rather than self-esteem ($R^2 = 0.14$). Following converting signs, two factors were found: negative and positive self-esteem ($r = 0.48$, $P < 0.001$).

The Activity Card Sort (functional) (Baum, 1995; [7]Baum and Edwards, 2001) is a q-sort assessment, including 89 pictures of people engaged in various activities. The instrument was originally designed for elderly populations with Alzheimer's disease. It was translated into Hebrew and was used with students, as well as the elderly population, in Israel (Sachs and Josman, 2003). In the current study, version C of this tool was used and produced two variables: (1) the number of activities in which the person was engaged at the time; and (2) the level of engagement in those activities. The level was sorted into the following categories: 0 = have never done; 1 = have stopped doing; 2 = do less; 3 = do

the same; 4 = do more. A correlation was found between the two variables in the study (-0.29 , $P < 0.01$). Only the number of activities was selected for inclusion in the model.

Present work/study status (functional) is a weighted measure of three items related to present work/study status: work position, study status, and time since leaving work.

The internal mediators

The internal mediators chosen for this study were cognitive appraisal of disability and typing performance.

The Client Self-Appraisal Scale (cognitive) based on Lazarus and Folkman (1984), was used in Hebrew for adults with spinal cord injury (Weill, 1991). Designed to measure the extent of stress caused by the disability, it includes 18 items on a five-point scale, ranging from 'strongly agree' to 'strongly disagree'.

Typing performance (functional), in the adapted work station was established, based on a standardized typing test of six lines followed by saving the file on a diskette. It consisted of three variables: (1) the occupational therapist's (OT) evaluation of the client's typing performance according to (a) time, (b) errors, and (c) independence; (2) the client's self-evaluation of his/her performance using the same three criteria; and (3) a calculation of whether there is a gap between the client's and the OT's evaluations of performance.

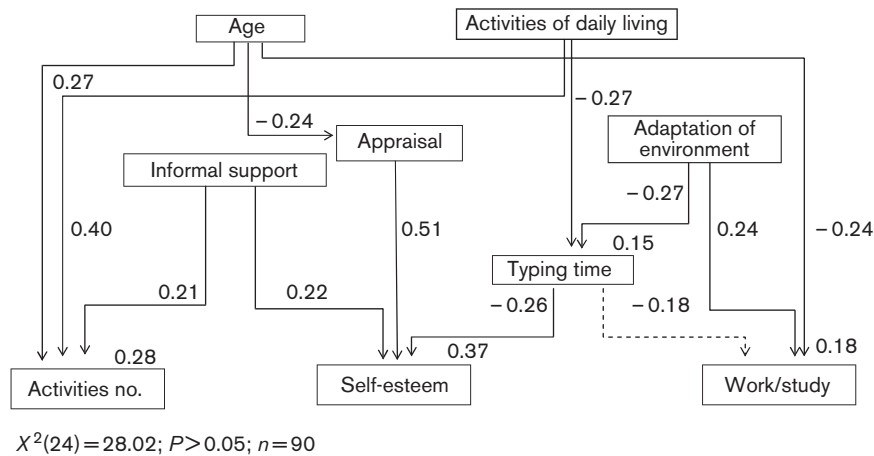
The external mediators

The external mediators chosen for this study were social support and adaptation of the computerized environment.

The Social Support Questionnaire (cognitive), developed by Dunst *et al.* (1986), refers to the social support sources of the respondent. It includes 18 items rated on a five-point scale, ranging from 'do not support' to 'supports most frequently'. Two variables were drawn from this tool: (1) the number of formal and informal support resources; and (2) the intensity of support available from each of them.

The Adaptation of Computerized Environment (ACE) (functional) is a new instrument that was specially developed for this research as a structured observation for OT experts to measure the physical environment. It consists of eight items rated on a three-point scale, ranging from 'substantial facilitator' to 'no facilitator'. Following psychometric validity and reliability procedures, the eight items were divided into two factors: (1) work station (chair, working surface, aids, supports); and (2) computer (input, output, software).

Fig. 3



The accepted model of adjustment to physical disability.

Data analysis

The suggested research model was analyzed by the Structural Equation Model, using AMOS software (Arbuckle JL, 2003. Chicago, Illinois, USA: Smallwaters Co.). In addition, detailed descriptive statistics were provided and multiple regressions were used to examine the explained variance of the three outcome measures.

Results

The standard error of the mean (SEM) did not yield any significant difference between the observed and structural (proposed) models. Thus, a goodness of fit was found between the observed model and the structured suggested model [$n = 90$, $\chi^2(24) = 28.02$; $P > 0.05$]. This non-significant result indicates that the data collected do fit the suggested conceptual model (Fig. 3).

No significant relationship was found between the three adjustment outcome measures (self-esteem, engagement in work/study, and involvement in various activities); however, they fit into the accepted model. Age and activities of daily living (ADL) were the only background variables that contributed to the model through a main effect on the adjustment outcome measures, but not on self-esteem. Age contributed directly to occupational outcomes, work/study status ($\beta = 0.24$), and engagement in activities ($\beta = 0.27$). Adaptation of computers and work stations contributed to work/study status ($\beta = -0.24$), and informal social support contributed to involvement in activities ($\beta = 0.21$) as independent variables in the model, rather than as mediators in the expected model.

Time of typing performance on an adapted computer serves as a mediator in the model, which contributed to involvement in work/study ($\beta = -0.18$) and to self-esteem

($\beta = -0.26$), and was explained by ADL ($\beta = -0.27$) and adaptation of work environment ($\beta = -0.27$).

Discussion

The present research examined people with severe disabilities who participated in an assistive technology assessment and intervention program. The primary goal of the research was to construct and test a model for adjustment to severe disability, incorporating both cognitive and occupational performance theories. Using SEM analysis, an overall goodness of fit was found between the observed and the expected models. The three outcome measures of adjustment to disability (involvement in work/study, engagement in activities, and self-esteem) and all of the components chosen for the structural model (appraisal, time of performance, physical and social support) fit well into the model. Self-esteem has a central role by connecting between the cognitive and the functional variables, though there are no correlation coefficients with the background variables included in the model. Furthermore, the time required for task performance was confirmed as the central mediator between the individual's level of functioning, involvement in work/study, and self-esteem.

The SEM analysis, however, identified a few changes between the expected and the observed models. First, the only background variables that appeared to fit into the model were age and rate of independence in ADL. As in other earlier studies (Jette *et al.*, 2003; Livneh and Wilson, 2003), this finding indicates that functional measures (ADL) contribute more to explaining participation than the medical diagnosis of disability. Furthermore, age is definitely an important contributor to an individual's social participation. Younger people with severe disabilities have better abilities and opportunities than

their older counterparts (Soejima *et al.*, 1999; Blackwell *et al.*, 2003), which may be attributable to greater knowledge, socialization, and access to technology.

Second, physical and social support changed from mediating to independent variables. This is quite a surprising finding because support, especially social, is considered to be a core moderator in any stress and coping cognitive theory (McCull and Skinner, 1995; Tein *et al.*, 2000; Nosek and Hughes, 2003). A possible interpretation for this finding is that people with severe disabilities may develop a dependency on their physical and social environment due to their functional limitations. This dependency may often be encouraged by significant others and may serve to block the perception of physical and social support as external sources of coping (Lacharite *et al.*, 1995; Skar, 2003).

Third, the appraisal of stress related to the severe disability is considered as a core mediator between the background data and the three outcome measures (involvement in work/study, engagement in activities, and self-esteem). Appraisal played a mediating role only with self-esteem, but not with the two other functional measures. It is documented in the stress and coping literature that appraisal serves as a cognitive measure (Young and McNicoll, 1998; Bent *et al.*, 2001; Livneh and Wilson, 2003; McGeary *et al.*, 2003). Appraisal expresses the person's perception of coping, but not necessarily with any connection to actual behavior. Therefore, it is possible that people with severe disability may appraise their coping ability or intent to participate, while their actual behavior or functioning is not consistent with their intent (Ajzen and Fishbein, 1973). Furthermore, other variables, such as attitudes and prevailing norms, may have an impact on their actual behavior.

Finally, self-esteem was not associated with the two functional outcomes (involvement in activities and engagement in work/study). This is quite a surprising finding because one would expect that greater involvement would be associated with a higher level of self-esteem (Barnwell and Kavanagh, 1997; Nosek and Hughes, 2003). One possible explanation is related to the sensitivity of Rosenberg's self-esteem questionnaire. Most of our respondents' self-esteem scores were concentrated in the upper range, leaving only a few with low scores. It may be an issue of self-selection that people with severe disabilities who aspire to improve their computer knowledge and skills already have higher self-esteem than those who do not show any interest in this area (Dunn, 1996). These issues require further research using a more sensitive self-esteem instrument for comparing the self-esteem measures of users and non-users of computer technology (Joinson, 2004).

This study has several clinical implications for the rehabilitation of people with severe disabilities by professionals involved in the interface between cognitive and functional approaches, with a specific focus on the role of technology. Aside from clarifying the research construct and its interpretations, the findings underline the need for practitioners to incorporate cognitive measures in their process of assessment and intervention among people with severe disabilities. The findings confirm that when individuals do not perceive their disability to be so threatening and feel that they are able to cope with it, they tend to perceive their informal support as gratifying and to report high self-esteem (Navala-Puranen *et al.*, 1999; Livneh and Wilson, 2003; Lund and Nygard, 2003). Regarding general recommendations for future research, it should be considered important to study longitudinally diversified populations, and to track their process of adjustment and their ability to respond to the use of assistive technology and cognitive intervention.

References

- Ajzen L, Fishbein M (1973). Attitudinal and normative variables as predictors of specific behavior. *J Pers Soc Psychol* **27**:41–57.
- Antonak RF, Livneh H (1991). A hierarchy of reactions to disability. *Int J Rehabil Res* **14**:13–24.
- Antonovsky A (1979). *Health Stress and Coping*. San Francisco: Jossey Bass. pub.
- Barnwell AM, Kavanagh DJ (1997). Prediction of Psychological adjustment to multiple sclerosis. *Soc Sci Med* **45**:411–418.
- Baum C (1995). The contribution of occupation to function in persons with Alzheimer's disease. *Journal of occupational science: Australian* **2**:59–67.
- Baum CM, Christiansen CH (2005). Person-environment-occupation-performance: an occupation-based framework for practice. In: Christiansen CH, Baum CM, Bass Haugen J (editors). *Occupational therapy: performance participation, and well-being*. 3rd ed. Throfare, NJ: Slack Incorporated.
- Baum CM, Edwards D (2001). *Activity Card Sort (ACS): Test Manual*. St. Louis: Program in occupational therapy, Washington University School of Medicine.
- Bent N, Jones A, Molloy I, Chamberlain MA, Tennant A (2001). Factors determining participation in young adults with a physical disability: a pilot study. *Clin Rehabil* **15**:552–561.
- Blackwell TL, Leierer SJ, Haupt S, Kampitsis A (2003). Predictors of vocational rehabilitation return to work outcomes in workers compensation. *Rehabil Couns Bull* **46**:108–114.
- Caya ML, Liem S (1998). The role of sibling support in high-conflict families. *Am J Orthopsychiatry* **68**:327–333.
- Christiansen C, Clark F, Kielhofner J (1995). Position paper: Occupation. American Occupational Therapy Association. *Am J Occup Ther* **49**:1015–1028.
- Day H, Jutai J, Woolrich W, Strong G (2001). The stability of impact of assistive devices. *Disabil Rehabil* **23**:400–404.
- Desrosiers J, Malouin F, Bourbonnais D, Richards CL (2003). Arm and leg impairments and disabilities after stroke rehabilitation: relation to handicap. *Clin Rehabil* **17**:666–673.
- Dunn DS (1996). Well-being following amputation: salutary effects of positive meaning, optimism, and control. *Rehabil Psychol* **41**:285–299.
- Dunst CJ, Trivette CM, Cross AH (1986). Mediating influences of social support: personal, family and child outcomes. *Am J Ment Defic* **4**:403–417.
- Groomes DAG, Leahy MJ (2002). The relationships among stress appraisal process, coping disposition, and level of acceptance of disability. *Rehabil Couns Bull* **46**:12–23.
- Jette AM, Haley SM, Kooyoomjian JT (2003). Are the ICF activity and participation dimensions distinct? *J Rehabil Med* **35**:145–149.
- Joinson AN (2004). Self-esteem, interpersonal risk, and preference for e-mail to face-to-face communication. *Cyber Psychology and Behavior* **7**:472–478.
- Jutai J (1999). Quality of life: an impact of assistive technology. *Rehabilitation Engineering* **14**:2–7.

- Kendall E (2003). Predicting vocational brain injury: a test of a psychosocial theory. *Journal of Vocational Rehabilitation* **19**:31–45.
- Kendall E, Terry DJ (1996). Psychosocial adjustment following close head injury: a model for understanding individual differences and predicting outcome. *Neuropsychol Rehabil* **6**:101–132.
- Krause JS, Kewman D, DeVito M, Maynard F, Cocker J, Roach MG, Ducharme S (1999). Employment after spinal cord injury: an analysis of cases from the Model Spinal Injury System. *Arch Phys Med Rehabil* **80**:1492–1500.
- Lacharite C, Boutet M, Proulx R (1995). Intellectual disability and psychopathology: developmental perspective. *Canada's Mental Health* **43**:2–8.
- Law M (2002). Participation in the occupations of everyday life. *Am J Occup Ther* **56**:640–649.
- Lazarus RS, DeLongis A, Folkman S, Gurin R (1985). Stress and adaptational outcomes: The problem of confounded measures. *Am Psychol* **40**:770–779.
- Lazarus RS, Folkman S (1984). *Stress, appraisal and coping*. New York: Springer.
- Lazarus RS, Folkman S (1993). Coping theory and research: past, present and future. *Psychosom Med* **55**:237–247.
- Liu C, McNeil JE, Greenwood R (2004). Rehabilitation outcomes after brain injury: disability measures or goal achievement? *Clin Rehabil* **18**:398–404.
- Livneh H, Antonack RF (1997). *Psychosocial adaptation to chronic illness and disability*. Gaithersburg, Md.: Aspen Publishers.
- Livneh H, Wilson LM (2003). Coping strategies as predictors and mediators of disability-related variables and psychosocial adaptation. *Rehabil Couns Bull* **46**:194–208.
- Lund ML, Nygard L (2003). Incorporating of resisting assistive devices: different approaches to achieving desired occupational self-esteem. *Occupation, Participation and Health, OTJR* **23**:67–74.
- Lutz BJ, Bowers BJ (2003). Understanding how disability is defined and conceptualized in the literature. *Rehabil Nurs* **28**:74–78.
- Maes S, Laventhal H, de-Ridder DTD (1996). Coping with chronic disease. In: Zeidner M, Endler NS (editors). *Handbook of coping: theory research and applications*. New York, NY, USA: John Wiley & Sons. pp. 221–251.
- McCarthy CJ, Lambert RG, Brack G (1997). Structural model of coping, appraisal, and emotions after relationship breakup. *J Couns Dev* **76**:53–54.
- McColl MA, Skinner H (1995). Assessing inter-and interpersonal resources; social support and coping among adults with a disability. *Disability and Rehabilitation Counseling Bulletin* **1**:24–34.
- McCubbin HI (editor) (1998). *Stress, coping, and health in families: sense of coherence and resiliency*. Thousand Oaks, California: Sage Publications.
- McGeary DD, Mayer TG, Gatchel RJ, Anagnostis C, Proctor TJ (2003). Gender-related differences in treatment outcomes for patients with musculoskeletal disorders. *Spine J* **3**:197–203.
- National organization on Disability (N.O.D.), The Harris Survey (2003). The State of the Union 2003 for Americans with disabilities. Available from <http://www.nod.org>. [Accessed 9 September 2005].
- Navala-Puranen N, Seuri M, Simola A, Elo J (1999). Physically disabled at work: need for ergonomic interventions. *J Occup Rehabil* **9**:225–236.
- Nosek MA, Hughes RB (2003). Psychosocial issues of women with physical disabilities: the continuing gender debate. *Rehabil Couns Bull* **46**:224–233.
- Pearlin LI, Lieberman MA, Menaghan EG, Mullan JT (1981). The stress process. *J Health Soc Behav* **22**:337–356.
- Pearlin LI, Schooler C (1978). The structure of coping. *J Health Soc Behav* **19**:2–21.
- Rimmerman A, Schwartz H, Li-or N (2000). Disabled people in the changing Kibutz: characters and utilization of their rights. *Social Security* **57**:167–182.
- Rosenberg M (1965). Rosenberg Self Esteem Scale (RSES): a psychology test. In: *Society and the adolescent self-image*. Princeton: Princeton University Press.
- Rosenberg M (1979). *Conceiving the self*. New York: Basic books Inc.
- Sachs D, Josman N (2003). The Activity Card Sort: a factor analysis. *Occupation, Participation and Health, OTJR* **23**:165–174.
- Schwochau S, Blanck P (2003). Does the ADA disable the disabled? – more comments. *Industrial Relations* **42**:67–77.
- Shaw L, Polatajko H (2002). An application of the occupation competence model to organizing factors associated with return to work. *Can J Occup Ther* **69**:158–167.
- Skar RNL (2003). Peer and adult relationships of adolescents with disabilities. *J Adolesc* **26**:635–649.
- Soejima Y, Steptoe A, Nozoe S, Tei C (1999). Psychosocial and clinical factors predicting resumption of work following acute myocardial infarction in Japanese men. *Int J Cardiol* **15**:39–47.
- Tein JY, Sandler IN, Zautra AJ (2000). Stressful life events, psychological distress, coping, and parenting of divorced mothers: a longitudinal study. *J Fam Psychol* **14**:27–41.
- Tzonichaki L, Kleftras G (2002). Paraplegia from spinal cord injury: self-esteem, loneliness, and life satisfaction. *Occupation, Participation and Health, OTJR* **22**:96–103.
- Vestling M, Tufvesson B, Lwaesson S (2003). Indications for return to work after stroke and the importance of work for subjective well-being and life satisfaction. *J Rehabil Med* **35**:127–131.
- Weill G (1991). Coping strategies of individuals with spinal cord injury and their families, according to the Lazarus and Folkman's model. [thesis in psychology] [in Hebrew]. Bar-Ilan University, Israel.
- World Health Organization (WHO) (2001). *International Classification of Functioning, Disability and Health-ICF*. Geneva: WHO.
- Young JM, McNicoll P (1998). Against all odds: Positive life experiences of people with advanced Amyotrophic Lateral Sclerosis. *Health Soc Work* **23**:35–43.

